

Attachment 11

To Operations/Human Performance Group Factual Report

DCA12IA096

Precursor Events Reported in ASRS

ACN: 980681 (2 of 11)

Time / Day

Date : 201111

Local Time Of Day : 0001-0600

Environment

Light : Daylight

Aircraft

Aircraft Operator : Air Carrier

Make Model Name : A321

Crew Size.Number Of Crew : 2

Operating Under FAR Part : Part 121

Flight Plan : IFR

Mission : Passenger

Flight Phase : Climb

Narrative: 1

Captain was the flying pilot. At 6,000 FT got [a] Hydraulic Green System Low Pressure [fault]. Transferred control of aircraft and radios to the First Officer. Captain performed initial part of ECAM by turning off the pump. Then received a Hydraulic PTU Fault and performed ECAM. Then Hydraulic Yellow Electric Pump Overheat with fault lights in both yellow hydraulic pump switches, performed ECAM. This immediately brought on autoflight/autopilot off ECAM followed by Hydraulic Green and Yellow Low Pressure ECAM. Captain performed all ECAM procedures and checklists. He made a PA to the flight attendant's and passengers while the First Officer declared an emergency and coordinated with ATC to return to field. Captain sent ACARS message to Dispatch, called Operations, and gave flight attendants the TEST information. At this point we had the following inoperative systems: flaps (slats only), stabilizer, brakes, thrust Rev 1-2, anti-skid, autobrakes, autopilot, nose wheel steering, yaw damper and other less important ones. We had to manually lower the gear (no retraction capability on go-around). On final, Captain and First Officer agreed to transfer control back to Captain for landing and discussed tail strike considerations and possible go-around. While Captain was flying, he recalled one note from the numerous ECAMs and checklists that directed the crew to restore Hydraulic Yellow System once the temperature came down. The First Officer selected the yellow pump back on. We now had an airplane that was very controllable. Many systems were recovered including flaps, stabilizer, yaw damper, some spoilers, one reverser, and brakes. We landed normally. We were airborne a total of 32 minutes. Maintenance found Green hydraulic reservoir empty.

The new training procedures worked great, but I probably should have written down the one important note to restore any systems if able. We were just fortunate that we had enough time left to consider what little we had and how to get back what we could. The First Officer was great at communicating with ATC and then me while aircraft pitch and altitude were critical along with speeds. Also, we turned autothrust off. It did not help with pitch control during dual **hydraulic system failure** and turbulence. Another factor was the flight attendants. Before we could call them or make a PA because our hands were full, two of them called from different locations on the long A321 to mention loud noises from the cargo compartment. It's important to notify them as quickly as you can to avoid interruptions in the checklists.

Callback: 1

The reporter states that approximately two minutes passed between the time that the Green System Low Pressure ECAM appeared and the PTU fault appeared and the PTU was turned off. Turning the Yellow system pump back on after the system cooled was nearly overlooked due to the numerous ECAM's present. The aircraft was a handful with both Green and Yellow systems inoperative.

Synopsis

A321 flight crew experiences loss of Green hydraulic system pressure during initial climbout, followed by a PTU fault and a Yellow hydraulic system overheat. Yellow system pump is turned off resulting in loss of flaps (slats only), stabilizer trim, brakes, thrust Rev 1-2, anti-skid, autobrakes, autopilot, nose wheel steering, yaw damper among other other less important items. The Yellow system is restored when the system cools resulting in restoration of most flight controls.

A320 dual hydraulic failure

ACN: 845633

Time / Day

Date : 200907

Local Time Of Day : 1801-2400

Environment

Flight Conditions : VMC

Aircraft

Aircraft Operator : Air Carrier

Make Model Name : A320

Crew Size.Number Of Crew : 2

Operating Under FAR Part : Part 121

Flight Plan : IFR

Mission : Passenger

Flight Phase : Climb

Narrative: 1

We departed 39 minutes after our scheduled departure time due to a fueling delay caused by needing to drip the left tank. We departed with me as the flying pilot. Takeoff and initial climb were normal through flap retraction and completion of the after takeoff checklist. I was hand flying the aircraft out of 8000 feet with a clearance to FL190 when we got a green hydraulic system ECAM. I turned on the autopilot to offload myself, and took over ATC communication while the Captain ran the ECAM. Things started to happen very quickly as the PTU surged while trying to pressurize the now empty Green system causing repetitive ECAM chimes, the A Flight Attendant called to report loud noises in the cabin, and the Yellow system pump overheated. The Captain was extremely busy running checklists and starting to coordinate with the cabin and dispatch. At this point we turned off the Yellow pump and PTU to get control of the overheat situation. I declared an emergency, coordinated with ATC for a return, and got us started on vectors to the north of the airport. At this point I was back to hand flying in Alternate Law on just the Blue hydraulic system. When the Captain completed the ECAM checklists and did a performance analysis, we realized we needed something like 13,000 feet of runway to land. We did some more holding while conferring with dispatch. About this time the Yellow pump had cooled below the overheat threshold and we regained the Yellow system, alleviating our landing distance problem. At this point we were ready to return for the visual approach. I flew the approach while the Captain did a manual gear extension. We configured early to allow for the gear extension and slower than normal flap/slat operation. The landing and rollout were uneventful with one reverser and light braking beginning at about 100 knots. Our landing weight was 16X,000 pounds, and touchdown was smooth and light. We stopped and shut down on the runway, and fire rescue was in position and communicating with us immediately. They chocked us and checked our brake temps, which we showed at about 255 degrees max. Company personnel arrived to tow us to the gate. Turning onto the lead-in line the tug blew a tire, which was quite loud and we

thought was a nose gear problem at first. Three items stand out to me about this incident. First, removing crews after an incident like this is essential. I was ready to continue, and didn't crash until about an hour later. At that point I was extremely fatigued. Secondly, automation (in this case the automatic operation of the PTU) was actually a detriment to our safety. To be able to work the problem and then select the PTU at our leisure would have eliminated a lot of confusion, excess ECAM warnings, and possibly the Yellow pump overheat. If the pump had failed or caught fire the situation would have obviously been much worse. Thirdly, the condensed training (I have only been on the A-320 since January) leaves some knowledge gaps. If it had been me trying to run five or six ECAM checklists at once, we would still be in holding. During training, most scenarios just let you start the ECAM and then it's a new airplane, new day, in order to accomplish too much training in too little time.

Narrative: 2

Approximately 4 minutes after takeoff passing 11,000 FT we received a GRN HYD SYS pressure low ECAM. We followed the ECAM and turned off the GRN HYD pump on the #1 engine. We informed Departure we were experiencing a hydraulic problem with a possible return to ZZZ. They gave us vectors around the local area while we ran checklists. The Flight Attendant then called saying the aircraft was making very loud strange noises and banging around mid cabin. We then received a YLW HYD overheat ECAM and noted the overheat indications on the HYD sys page. We attributed the problem to the PTU not being able to work because the GRN HYD quantity at this time was now empty. We elected to turn off the PTU which quieted the noise in the cabin and followed the ECAM for YLW HYD SYS overheat which directed us to turn off the YLW HYD SYS pump on the #2 engine. We were now down to one hydraulic system and elected to declare an emergency and return to ZZZ. Dispatch was advised of our **dual hydraulic failure** and emergency return via ACARS. I advised the flight attendants we were returning and asked them to follow the Cabin Advisory checklists with a return in approximately 15-20 minutes. I informed the passengers we were returning due to an aircraft malfunction. The airplane was now in Alternate Law with the First Officer hand flying the aircraft and working the radios while I ran checklists and consulted with Dispatch. The First Officer was fairly new to the Airbus, but did an outstanding job in keeping us in touch with ATC and handling the aircraft with no autopilot. I reviewed the landing distance charts as part of the procedures and found we could not legally land with the weight we had at ZZZ or any other airport I knew of. The landing distance with GRN and YLW hydraulics inoperative was better than 13,000 FT.

Synopsis

A320 Flight Crew reports loss of the Green hydraulic system during climb out. The Yellow hydraulic pump overheats and is turned off putting the aircraft in Alternate Law. The Yellow pump cools and is restored prior to landing at departure airport.

ACN: 779321

Time / Day

Date : 200803

Local Time Of Day : 1201-1800

Environment

Flight Conditions : VMC

Light : Daylight

Aircraft

Aircraft Operator : Air Carrier

Make Model Name : A319

Operating Under FAR Part : Part 121

Flight Plan : IFR

Mission : Passenger

Flight Phase : Initial Climb

Narrative: 1

CLBING THROUGH ABOUT 10500 FT, ECAM GREEN SYS LOW PRESSURE FOLLOWED BY LOW QUANTITY. AFTER FOLLOWING ECAM PROCS, WE GOT ANOTHER ECAM YELLOW SYS INTERMITTENT OVERHEAT. WE ADVISED ZZZ DEP CTL THAT WE WISHED TO RETURN TO THE FIELD. AT THIS POINT AN EMER WAS DECLARED AND WE RECEIVED VECTORS TO RWY FOR LNDG. COMPANY, PAX, AND CREW WERE THEN ADVISED. I ALSO ADVISED THE FLT ATTENDANTS THAT A NORMAL TOUCHDOWN AND LNDG WAS EXPECTED. A MANUAL GEAR EXTENSION WAS REQUIRED AND FULL FLAPS WAS AVAILABLE AND USED. ON SHORT FINAL, I ADVISED THE TWR THAT WE WOULD PROBABLY NOT HAVE NOSEWHEEL STEERING AVAILABLE FOR TURNING OFF THE RWY. **WE LANDED OVERWT AT 158000 LBS** WITH A NORMAL TOUCHDOWN (LESS THAN 350 FPM DSCNT), WITH A LONG ROLLOUT. AFTER THE FIRE DEPT CHKED THINGS OUT, THE GND CREW INSTALLED THE GEAR PINS AND TOWED US TO THE GATE WITHOUT FURTHER INCIDENT.

Synopsis

A320 FLT CREW DECLARES EMERGENCY AND RETURNS TO DEPARTURE ARPT DUE TO GREEN SYSTEM **HYDRAULIC FAILURE**.